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Predicting Youth Mental Health Treatment Dropout:

An Examination of the Role of Treatment Adherence and Therapist Competences

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Predicting Youth Mental Health Treatment Dropout: An Examination of the Role of Treatment Adherence and Therapist Competences

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Abstract

Predicting Youth Mental Health Treatment Dropout: An Examination of the Role of Treatment Adherence and Therapist Competences

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Dropout from youth mental health services is a significant concern that has been widely studied in the field. Previous research has examined a variety of client factors (age, gender, etc.) and some therapy process factors (perceived burden of treatment, alliance, etc.) that are potentially related to therapy dropout; however, the results are far from conclusive. With data gathered as part of a previous randomized controlled trial, multilevel modelling was used to examine the extent to which child age, race/ethnicity, problem area, income, baseline symptom severity, therapist discipline, and the therapy process factors of therapeutic alliance, adherence, and competence are predictive of dropout. Results indicated that of these factors, only problem area was a significant predictor. Caregiver-rated therapeutic alliance and race/ethnicity also approached significance.

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INTRODUCTION

Premature termination, or dropout, from child and adolescent psychotherapy is a long-standing and established problem in mental health services. Approximately 11.3% of children in the United States have a diagnosable mental disorder that results in severe impairment; however, only one fourth to one half of these youth actually seek treatment (Merikangas et al., 2010). Of the youth who do seek treatment, between 16% to 75% will "drop out," depending on the sample and definition of dropout used (Warnick, Gonzalez, Weersing, Scahill, & Woolston, 2012; Baruch, Vrouva, & Fearon, 2009; De Haan, Boon, de Jong, Hoeve, & Vermeiren, 2013; Midgley & Navridi, 2006). Dropping out of psychotherapy contributes to the many youth with significant mental health problems who remain underserved.

Dropping out of psychotherapy has negative implications at both the individual and systemic levels. At an individual level, children with untreated behavioral and emotional concerns are more likely to have ongoing psychiatric symptoms and functional impairment in adulthood (Block & Greenbo, 2011; Dadds et al., 1999). Additionally, these children are more likely to drop out of school, engage in delinquent behaviors, and become unemployed (Boggs et al., 2004). Individuals with untreated anxiety disorders are at increased risk for other poor outcomes, such as academic underachievement and substance abuse (Kim, Munson, & McKay, 2012; Woodward &Fergusson, 2001).

Dropout is also costly to mental health systems because it increases the number of unfilled appointment hours, decreases staff productivity and results in an increased unit cost per services provided (Armbruster & Kazdin, 1994). Individuals who drop out of

therapy have been shown to contact mental health facilities at twice the rate as therapy completers (Ries & Brown, 1999), resulting in multiple intakes which increases costs. Additionally, unfilled appointment hours, or "no show" hours that typically precede a patient "dropping out" can demoralize therapists, who may believe they have failed or were rejected by the client, which in turn, could impair clinicians' sense of self-worth and effectiveness (Pekarik, 1985).

Given the negative individual outcomes associated with mental health treatment dropout and the increased burden that dropping out places on mental healthcare systems, understanding the factors that influence the decision to drop out of youth mental health treatment is imperative. Ascertaining definitive conclusions about adolescent mental health treatment dropout is difficult for a variety of reasons, including inconsistencies with how the research has defined "dropout," variations in study type, and a lack of unifying framework under which to conceptualize the phenomenon. These challenges will be discussed next.

Definitional Difficulties

One primary difficulty in the current dropout research is that "dropout" has been operationally defined in various ways across the youth treatment literature. "Dropout" has included patients who were offered an intake appointment but never initiated treatment, patients who only attended an intake screening appointment but never began an episode of therapy, patients on a waitlist who never started therapy, and patients referred to other clinics (Armbruster & Kadin, 1994). In a recent meta-analysis, de Haan and colleagues (2013) noted that studies tended to define dropout in one of two ways: (1) through

completion of a certain number of sessions, and (2) through therapist classification. The first definition is troublesome because some patients, while terminating treatment after only a few sessions or earlier than dictated by an established protocol, might still experience sufficient improvement in their mental health and perhaps should be considered successful terminators. The second definition also has the potential for methodological inconsistency. For example, some studies exclude patients for reasons such as moving or inability to pay for treatment (e.g., Richmond, 1992), but these patients are included as "dropouts" in other studies (e. g., Baruch, Gerber, & Fearon, 1998). Moreover, different predictors of dropout have emerged depending on the definition of dropout used (Warnick et al., 2012).

Study type

Definitive conclusions regarding child and adolescent treatment dropout is further complicated by the type of study being conducted: efficacy or effectiveness. Efficacy studies are controlled treatment trials in which well-defined groups of patients are randomly assigned to conditions; additionally, efficacy studies prioritize therapists adhering to the treatment intervention, thereby increasing replicability and reliability, which has led to the widespread use of rigid treatment manuals with a set number of sessions (Nathan, Stuart, & Dolan, 2000). In contrast, effectiveness studies aim to determine whether treatments are feasible and have measurable effects across broad patient populations and in real-world settings. In effectiveness studies, research participants are drawn from patients in real-world settings, and differ from those in research efficacy-trial settings in that they tend to be more ethnically diverse (Ehrenreich-

May et al., 2011), tend to be from single parent families of significantly lower socio-economic status (Southam-Gerow, Weisz, & Kendall, 2003; Southam-Gerow, Chorpita, Miller, & Gleacher, 2008), and tend to exhibit significantly more externalizing comorbidity (Southam-Gerow, Weisz, & Kendall, 2003; Ehrenreich-May et al., 2011).

Additionally, the real-world settings of effectiveness trials mean that implementation more closely mirrors the treatment found in clinical practice, with less emphasis on high fidelity to the treatment protocol (Garland, Bickman, & Chorpita, 2010; Glisson et al., 2008). A study that looked at the effects of manual based cognitive-behavioral therapy in both research settings and practice settings found that while clinicians in both settings initiated treatment with the same level of quality, the quality of intervention implementation (i.e., fidelity) increased over time for clinicians in the research setting and decreased over time for clinicians in the practice setting (Smith et al., 2017). Additionally, observer-rated therapeutic alliance between the youth client and the therapist was significantly higher in the research setting than in practice settings, even when controlling for youth characteristics (McLeod et al., 2016).

These differences between efficacy and effectiveness studies could have an impact on dropout. For example, patients with a lower socio-economic status experience many logistical barriers to treatment, such as a lack of medical insurance, lack of transportation to the clinic, or lack of childcare for other children that could make completing treatment more difficult. Similarly, if the therapist and the client have less of a bond or relationship, as indicated by therapeutic alliance, then the client may be less likely to continue therapy. Indeed, De Haan et al. (2013) compared 18 efficacy studies

and 32 effectiveness studies and found different predictors of dropout between them, even when accounting for different definitions of dropout.

Theoretical framework

Another difficulty with determining definitive conclusions from the youth mental health treatment dropout literature is the lack of a unifying theoretical framework to guide the study of dropout. Typically, research is conducted by comparing a group of "dropouts" to a group of "completers" to identify variables that significantly differ across the two groups and then building a model based on those variables. This sample-driven methodology could help explain the lack of generalizability across various studies, especially considering the heterogeneity of the samples. Psychotherapy treatment can occur in a variety of settings (e.g. clinics, hospitals, schools, online) with a variety of different professionals (e.g. primary care physicians, psychologists, counselors, social workers) for a host of different concerns (e.g. depression, anxiety, substance use, eating disorders, and behavioral problems). Generalizing to the entire population of child and adolescents who receive psychotherapy services is especially difficult.

Two main, complementary conceptual models of treatment dropout have been studied to different degrees: the risk-factor model and the barriers-to-treatment model, sometimes called the burden of treatment model (Kazdin, 1996). The risk-factor model is drawn from epidemiological and public health fields and focuses on identifying antecedent conditions that increase the likelihood of an individual dropping out of treatment. Inherent in this approach is the understanding that multiple interacting antecedent factors are likely to be evident to increase the likelihood of dropping out and

that no single subset of risk factors may be necessary or sufficient to determine dropout. Most of the research to date on dropout of youth psychotherapy draws on the risk-factor model, despite not formally referencing it (Armbruster & Fallon, 1994; Dierker, Nargison, Wiseman, & Hoff, 2001; Mirabito, 2001; Johnson, Mellor, & Brann, 2008), and a variety of client characteristics have been tested as potential predictors of dropout. When limiting the studies to effectiveness trials wherein dropout was defined as the therapist noting in the chart that the client chose to discontinue treatment against the therapist's advice, the following child characteristics predicted dropout in at least two independent studies: child age (de Haan, Boon, Jong, Geluk, & Vermeiren, 2014; Wamser-Nanny & Steinzor, 2016; Baruch et al., 2009; Baruch, Gerber, & Fearon, 1998), socio-economic status (Sirles, 1990; Wamser-Nanny & Steinzor, 2016; Armbruster &Fallon, 1994), racial/ethnic minority designation or African American race (see de Haan et al., 2014 for review), diagnosis (Wamser-Nanny & Steinzor, 2016; Sprang et al., 2013; Mirabito, 2001; Baruch et al., 2009; Johnson et al., 2008), and severity at intake (Baruch et al., 2009; de Haan et al., 2015).

The barriers-to-treatment model focuses on the adverse conditions and treatment demands that make attending and participating in treatment untenable. This model posits that families experience multiple barriers to participating in treatment: a) practical barriers such as lack of transportation or childcare, and high costs; b) perceptions that treatment is demanding or not relevant to the child's problems; c) poor relationship between the therapist and client and/or caregivers. In populations of children with externalizing problems in university research clinics, higher parent and therapist

perceived barriers to treatment predicted dropping out and mediated the relationship between risk factors (such as low SES, minority group status and aversive parenting practices) and dropping out of treatment (Kazdin, Holland, Crowley, & Brenton, 1997; Kazdin, Holland, &Crowley, 1997). With respect to client perceptions of treatment, in disorder-nonspecific samples of children in community clinics, the perceived relevance or credibility of the proposed treatment has been shown to be related to dropout (Stevens, Kelleher, Ward-Estes, & Hayes, 2006; Wergeland et al., 2015; Chacko, Wymbs, Rajwan, Wybs, & Feirsen, 2017). Moreover, client/caregiver-reported therapist relationship problems have been shown to be related to dropout as well (Garcia & Weisz, 2002; Stevens et al., 2006; Oruche, Downs, Holloway, Draucker, & Aalsma, 2013; de Haan et al., 2014).

The barriers to treatment model has been used to bridge the gap between the identified antecedent risk factors that increase vulnerability for dropping out and the actual reasons why someone drops out by focusing on both concrete factors that influence treatment attendance and factors related to the process of therapy itself (perceived relevance of treatment and therapeutic alliance). Accounting for treatment relevance and therapeutic relationship is an important first step in understanding the complicated factors that contribute to dropout; however, this model could be bolstered by the addition of other treatment process variables that could influence the treatment participation and dropout. A framework that could be helpful in determining which process variables may be relevant to dropout is the Quality of Care framework. While the Quality of Care

framework has not been utilized in the examination of dropout, it has the potential to augment the previous dropout models.

Quality of Care Framework

The Quality of Care framework was introduced by McLeod, Southam-Gerow, Tully, Rodriguez, and Smith (2013) as a theoretical framework of treatment indicators that can be used to explain treatment outcomes. The Quality of Care framework posits that structural elements of healthcare settings (e.g., attributes of the clients, providers and settings) and the processes of care (e.g., activities and behaviors associated with receiving care) influence patient outcomes (e.g., symptom reduction, dropout). This framework is used with the goal of identifying quality indicators (the structure and process elements) that lead to improvements in patient outcomes (McLeod et al., 2013). A visual representation of the model is presented in Figure 1. This model holds that, in treatment sessions between a youth, caregivers, and the therapist, treatment outcomes (of which dropout could be considered one) are influenced by both structural factors and process factors. Structural factors can include the individual characteristics of the youth (e.g., age, diagnosis), the caregiver (e.g., perspectives of treatment, parental stress), the family (e.g., SES, single-parent), the therapist (e.g., orientation, education), or characteristics of the organization (e.g., wait times, payment methods). Between these structural elements and the ultimate outcomes of treatment are the in-session processes of therapy, such as the relationships amongst interested parties, and variables related to the delivery of the intervention, such as what kind of therapy is used and how skillfully the therapist delivers

it. These process variables co-exist temporally; however, causal relationships have not been established (Kazdin, 2007).

In the context of dropout, the Quality of Care framework appears to combine the risk-factor framework to inform the structural elements of interest, and expands on the burden-of-treatment framework to include potential process variables of interest outside of relational processes such as the therapeutic alliance by including the process variables of therapeutic adherence, differentiation, and competence (together referred to as treatment fidelity). In general, treatment fidelity describes the degree to which a given therapist skillfully follows prescribed therapy procedures (McLeod et al., 2013). The addition of these constructs could further our understanding of the predictors of child and adolescent dropout in a way that has not been captured in the current dropout research. In the following sections, the proposed variables of relational processes (alliance), therapist adherence/ differentiation, and therapist competence are explained and their relationship to youth psychotherapy dropout is discussed.

Therapeutic Alliance. Bordin (1979) described the trans-therapeutic therapeutic *alliance*, composed of the interpersonal bond between therapist and client, the dyad's ability to collaborate on in-session tasks, and shared therapy treatment goals. Factor analysis has indicated that within youth psychotherapy, alliance is comprised of: a) bond, the affective connection between therapist and client, and b) task, agreement on the activities of therapy (Shirk & Saiz, 1992). In meta-analyses, therapeutic alliance was found be related to child outcomes, with effect sizes from r=.14 (McLeod, 2011) to r = .26 (Shirk & Karver, 2003).

In the dropout literature, a few studies have examined the connection between therapeutic alliance and youth dropout. Because youth psychotherapy typically involves not just the therapist and client but also the caregiver in the process, studies of alliance typically involve measuring both the parent-therapist alliance and the child-therapist alliance. With regards to the clearly defined therapeutic alliance, lower parent-rated therapeutic alliance has been shown to be related to dropout in children with disruptive behavior disorders (Kazdin & Wassell, 1998; Garland, Haine-Schlagel, Accurso, Baker-Ericzen, & Brookman-Frazee, 2012) and to dropout in some community mental health samples (Oruche et al., 2013; de Haan et al., 2014; Hawley & Weisz, 2005). However, in a different community sample, Jensen-Doss and Weisz (2008) found that therapeutic alliance did not predict dropout. Furthermore, in populations of adolescents undergoing functional family therapy for behavior problems, the simple rating of therapeutic alliance was not related to dropout but a discrepancy between the parent-therapist and child-therapist alliance was (Robbins, Turner, Alexander & Perez, 2003).

Adherence/Differentiation. Therapist adherence is defined as the degree to which the therapist follows a treatment's established procedures. Treatment differentiation is the degree to which a given treatment differs from other potential treatments. In randomized controlled trials (RCTs) adherence and differentiation are easily identifiable as there are two distinct treatments or conditions being compared, with the treatment condition being highly structured to help distinguish the active ingredients in that condition from the control condition. In community mental health practice, as noted, therapists often implement practices more flexibly with clients with different, and

typically more complex/ comorbid disorders than in research efficacy trials (Southam-Gerow et al., 2003; Ehrenreich-May et al., 2011; Garland, Brookman-Frazee, Hurlburt et al., 2010). In these cases, adherence can be assessed based on the presence (or absence) of established evidence-based practice (EBP) elements rather than how therapists follow the prescribed steps of a particular treatment program (McLeod, Southam-Gerow, & Weisz, 2009; McLeod et al., 2013). Evidence-based practice elements are the specific techniques and procedures (e.g., relaxation, exposure, time out) that make up the evidence-based treatment protocols for specific problem areas (Chorpita, Becker, & Daleiden, 2007). Thus, adherence can be conceptualized as the ratio of EBP compared to other activities that might occur in sessions (McLeod et al., 2013). This conceptualization of adherence incorporates both the constructs of adherence and differentiation and is useful when characterizing treatment in community settings.

Unfortunately, adherence has been understudied in child and adolescent psychotherapy treatment literature (Perepletchikova, Treat, & Kazdin 2007). Increased treatment adherence shows marginal associations with treatment attendance ($p = .059$), a construct closely related to dropout (Garland et al., 2012). Results regarding the predictive relationship between adherence and dropout have been mixed, with Liber and colleagues (2010) finding no significant predictive relationship in a sample of children with anxiety and Thijssen, Albrecht, Muris, and Ruiter (2017) finding a significant relationship in their sample of children with behavior problems. In this study of Parent Management Training- Oregon model (PMTO), therapists of treatment completers had higher adherence ratings during training than therapists of dropouts (Thijssen et al.,

2017). While these results provide some support for the validity of adherence as a significant predictor of dropout, the measure was only an approximation of the level of adherence the therapist actually utilized in session with clients.

Competence. Therapist competence is the therapist's skill and judgement in delivering the intervention appropriately (Southam-Gerow & McLeod, 2013). Research on therapist competence in psychotherapy, in general, is limited. Even research on the relationship between competence and general mental health outcomes are inconsistent (Webb, DeRubeis & Barber, 2010; Barber, Sharpless, Klostermann & McCarthy, 2007; Hogue et al., 2008). The lack of consistent results could be due to potential moderating variables such as therapeutic alliance (Webb et al., 2010) or difficulties in reliably measuring competence separate from adherence (Barber et al., 2007; Hogue et al., 2008). To our knowledge, no studies have examined competence and its relationship to dropout.

In summation, the Quality of Care framework can provide insight into the phenomenon of dropout because it posits that treatment implementation process factors such as therapeutic alliance, treatment adherence/differentiation, and therapist competence are important influencers of outcomes. As depicted in Figure 1, the Quality of Care framework posits complex bi-directional interactions between the various structural elements, process elements, and outcomes. In the context of dropout, for example, client/ therapist characteristics would directly influence dropout, and the degree of treatment adherence/ therapist competence; treatment adherence/therapist competence would then directly influence dropout. Additionally, dropping out of treatment could then interact with treatment adherence/ therapist competence at the therapist level, as

therapists who have clients dropout early in treatment get less practice adhering to later treatment elements and thus may do them less skillfully. Dropout could also influence the structural therapist characteristics of confidence or self-efficacy, which in turn influences dropout and the process elements.

Examining the complex, bidirectional, interrelated nature of the various elements in the Quality of Care framework are outside the scope of this study; however, an important first step regarding the Quality of Care framework and its potential applicability to the phenomena of dropout is to examine if the proposed process factors of treatment adherence and therapist competence are predictive of dropout in addition to the variables identified by existing literature.

Current Study

The current study seeks to address the some of the aforementioned concerns related to studying dropout in youth mental health psychotherapy by examining the additional process elements of treatment adherence and competence in the context of youth treatment dropout. Drawing upon the Quality of Care framework, the current study will examine the predictive nature of various "risk factors" identified in previous dropout literature (structural characteristics) with the addition of therapy process level factors in explanation of this phenomenon. Using data from a previously completed community based randomized controlled effectiveness trial (Weisz et al., in press) this study seeks to address the question: To what extent do process-level therapy factors (adherence, competence, relationship) predict youth mental health treatment dropout, while accounting for a wide array of other potential predictive factors that have been previously

identified in the literature? Considering the differences between caregiver-report and child-report measures when studying youth mental health, two separate groups of hypotheses (one for client-reported variables and one for parent-reported variables) will be tested.

Hypothesis 1a. Client and therapist structural characteristics (client age, family income, race/ethnicity, problem area, *client-reported* severity at intake, and therapist discipline) will be predictive of dropout from youth mental health treatment.

Rationale for Hypothesis 1a. These variables were chosen as the structural characteristics of interest as they have been shown in previous research under the risk factor model to be predictive of dropout, when dropout was defined by therapist. In this study, income is used as a proxy variable for socio-economic status, which has been shown to be predictive of dropout (de Haan et al., 2013; Wamser-Nanny & Steinzor, 2016; Armbruster & Fallon, 1994). Therapist discipline was chosen as a predictor as it has been demonstrated in previous research to be predictive of dropout (Sirles, 1990).

Hypothesis 1b. Therapy process characteristics (Adherence, Competence, *Client-reported* Therapeutic Alliance) will be predictive of dropout from youth mental health treatment.

Rationale for Hypothesis 1b. These process characteristics were chosen as they were the identified by the Quality of Care framework as being important for treatment outcomes.

Hypothesis 2a. Client and therapist structural characteristics (client age, family income, race/ethnicity, problem area, *caregiver-reported* severity at intake, and therapist discipline) will be predictive of dropout from youth mental health treatment.

Rationale for Hypothesis 2a. As above, these variables were chosen as the structural characteristics of interest as they have been shown in previous research under the risk factor model to be predictive of dropout, when dropout was defined by therapist.

Hypothesis 2b. Therapy process characteristics (Adherence, Competence, *Caregiver-reported* Therapeutic Alliance) will be predictive of dropout from youth mental health treatment.

Rationale for Hypothesis 2b. These process characteristics were chosen as they were the identified by the Quality of Care framework as being important for treatment outcomes. Additionally, as previously mentioned parent-rated therapeutic alliance has been shown in previous literature to be predictive of dropout when dropout was defined by therapist (Hawley & Weisz, 2005).

METHOD

Data for this study was drawn from the Child STEPs sustainability study (Weisz et al., in press) which tested the effects of a modular evidence-based treatment for anxiety, depression, trauma or conduct problems (*Modular Approach to Therapy for Children with Anxiety, Depression, Trauma, or Conduct Problems*; MATCH; Chorpita & Weisz, 2009) on child outcomes in two consecutive cohorts relative to comparison conditions. Treatment was implemented by community providers employed by participating agencies who were randomly assigned to MATCH with expert consultation vs. the comparison conditions. In this study, only the MATCH condition was included.

In the first phase of this study, which lasted 2 years and 8 months, 26 clinicians from three large outpatient community mental health clinics were trained and supervised in the use of MATCH. Youth presenting with anxiety, depression, post-traumatic stress and/or conduct problems, referred to the three participating clinics through normal community channels were consented to participate in the study and were randomly assigned to these therapists or to therapists in the usual care condition (not included in the current analyses). In the second phase, which lasted 2 years and 11 months, a new group of 27 clinicians from the same three clinics were trained in MATCH. Participating youth in this phase were also randomly assigned to a therapist. For the purposes of this analysis, only therapist participants who received training in the use of MATCH and their clients were included; thus, data includes the MATCH treatment group from the first phase and all clinicians/clients from the second phase.

Treatment:

MATCH is a synthesis of the evidence-based practices for youth with anxiety, depression, trauma, or conduct problems. The treatment manual includes 33 modules (3-4-page descriptions of specific treatment components); handouts, treatment aids, and flowcharts to guide clinician decision-making (e.g. which modules to use, in which order, for a particular youth, and how to adjust the module sequence depending on youth response during treatment) are also included in the manual. In two prior randomized effectiveness trials, MATCH has shown significant clinical benefit relative to usual clinical care (Weisz et al., 2012; Chorpita et al., 2013) and to standard evidence-based treatments (Weisz et al 2012; Chorpita et al., 2017).

Participants:

Therapist Participants. Therapist participants (N= 52) were employees at three large community mental health care agencies in New England who routinely provided psychotherapy to youth. The three agencies were free-standing, independent, non-profit entities funded through reimbursement for services (through insurance, primarily Medicaid) and were among the largest in their geographic region. Participating therapists were predominantly Caucasian (86.8%), female (98%) and social workers (73.6%); they had a mean age of 45.2 with an average of 11.6 years of professional experience. Therapists had between one and twelve clients, with an average of 3.32 clients per therapist (median three clients/therapist). The majority (71.7%) of therapists had three or fewer clients. Therapists who were present for both the first phase and the second phase

of the original study tended to have more clients than those who were only present for one of the phases, as would be expected.

Youth Participants. Youth clients (N = 168) age 6-16 years old were eligible for participation in the larger study if they were referred to any of the three participating agencies and presented with anxiety, depression, post-traumatic stress and/or conduct problems. Youths were excluded if there was evidence of intellectual disability, pervasive developmental disorder, psychotic symptoms, bipolar disorder, or if their top ranked clinical concern involved inattention or hyperactivity. Although youth could be treated for more than one disorder within the treatment, the problem area that corresponded with the highest scores on the intake measure resulted in a "primary problem" designation of anxiety, depression, post-traumatic stress or conduct problems. Only youth being treated by a therapist trained in MATCH were included in this analysis. The sample included 168 youth who received therapy from a MATCH therapist and had complete baseline data. Youth characteristics are provided in Table 1.

Measures:

Predictors of Interest: Therapist, Child, and Therapy Process variables.

Therapist Background Questionnaire. This questionnaire was administered to therapist participants at baseline and gathers data on the therapist's gender, race/ethnicity, degrees, and discipline (e.g. social worker, psychologist, etc.). Given the lack of diversity in race/ethnicity in the original sample, these variables were not included in the analysis.

Child Demographics Questionnaire. This questionnaire was administered to participants and their families at baseline and contains items pertaining to the child (age,

gender, race/ethnicity, primary problem area) and caregiver (relationship to child, income).

Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001***).*** The CBCL was used as a measure of baseline symptom severity. The CBCL is a widely used 118-item caregiver-report measure of youth emotional and behavioral problems. Items are rated as 0 (*Not True*), 1 (*Somewhat or Sometimes True*), or 2 (*Very True or Often True*). The Total Problems was utilized as the measure of baseline symptom severity. Total Problem T-scores of less than 60 are considered in the normal range, scores of 60-63 represent the borderline range, and scores greater than 63 are considered to be in the clinical range. This scale has been shown to have good to excellent internal consistency reliability (ICC) with a Cronbach's alpha of .97 (Achenbach & Rescorla, 2001). The Total Problems scale demonstrated an excellent ICC ($\alpha = .91$) in the current sample as well.

Youth Self-Report (YSR; Achenbach & Rescorla, 2001***)*** - The YSR is a 118-item youth self-report counterpart to the CBCL designed for youth age 11-18. However, subsequent research has indicated that the broadband scales (Total Problems, Internalizing and Externalizing) are reliable and valid for children as young as 7 (Yeh & Weisz, 2001). The Total Problems T-scores were used as measures of child-reported baseline symptom severity. Scores follow the same cutoffs described above. Validity and reliability evidence for these scales is extensive and similar to the CBCL (Achenback & Rescorla, 2001). The Total Problems scale demonstrated a good ICC ($\alpha = .88$) in the current sample.

***Therapeutic Alliance Scale for Children* (*TASC-C/ P*;** Shirk & Saiz, 1992**).** Both the TASC-C and TASC-P consist of eight items measuring the affective bond between the client/ caregiver and therapist. Responses to items like, "I like spending time with my therapist," are scored on a 1 (not at all) to 4 (very much) Likert-type scale. The sum of the item responses (Total score) reflects the overall alliance. The TASC-C demonstrated good internal consistency (8 items; α=.82) in the current sample and the TASC-P demonstrated similarly good internal consistency (8 items; α=.84). An average of all pre-termination scores for each child and parent informant were used as measures of therapeutic alliance.

***Therapist Integrity in Evidence Based Interventions* (*TIEBI; Bearman, Herren & Weisz, 2012*).** Therapist adherence and competence to any cognitive-behavioral EBP were measured using the TIEBI coding system. The TIEBI coding system measures adherence by requiring coders to note the presence/absence of 22 separate MATCH strategies in five-minute increments. The TIEBI measures therapist competence based on coders' global ratings of skillfulness of delivery of each MATCH strategy, ranging from 0=not present to 4=expert.

TIEBI coders (N=10) were bachelors' and masters' level research assistants in the primary coding system developer's laboratory and were blind to study condition. Inter-rater reliability for the TIEBI in a subset of 16.8% of all coded sessions (N=493) for the larger STEPs study was ICC (1,1) = 0.71 to ICC (1,1) = 0.99, with a mean of ICC (1,1) = 0.92 for MATCH adherence, and from ICC (1,1) = 0.70 to ICC (1,1) = 0.97, with a mean of ICC (1,1) = 0.88 for MATCH competence. Sessions were selected using the following

procedures: a) First sessions were omitted (these often included clinic administrative content), b) All remaining sessions were divided into thirds (early, middle, late phase of treatment), and c) One session was randomly selected for coding from each of these three phases, omitting sessions shorter than 15 minutes or longer than 75 minutes (these were typically unrepresentative—e.g., clinic paperwork).

Average adherence for each youth's treatment episode was calculated by summing the number of five-minute segments in which at least one of the 22 strategies were coded "present," multiplied by five (number of minutes in each segment), and divided by the total time of each session, in minutes. The resulting mean percentages were then averaged across the coded sessions for each youth's treatment episode. Average competence for each youth's treatment episode was calculated by averaging all competence scores for each present strategy across each coded session. Competence scores of 0 were excluded, as 0 indicates that the content strategy was not used and so there was no opportunity for the therapist to demonstrate competence. This mean is then averaged across all coded sessions for each youth's treatment episode.

Outcome of Interest – Dropout.

Therapist Designated Dropout. Therapists classified the various reasons that their patients ended treatment, including: Routine Termination, Lost to Therapist, Withdrew from Study, Withdrew from Therapy. Additional notes were sometimes provided as context to these classifications. In general, patients who were classified as "lost to therapist" and "withdrew from therapy" were coded as treatment dropouts, unless a note indicated that the client was still receiving treatment in some capacity. For example, one

client who was classified as “withdrew from therapy” also had a note that indicated that they were transferred to a higher level of care, and were therefore not considered a dropout. Individuals who were classified as “routine termination” were coded as not-a-dropout. Individuals classified as “withdrew from study” were excluded from the analysis as it is unclear if they continued in treatment outside of the study.

Data Analysis:

SPSS (version 25; IBM Corp., 2017) was used to calculate baseline client sample descriptive statistics and descriptive statistics for process variables, and to calculate correlations between predictor variables. Given the nested data structure (children/parents within therapist) and the dichotomous nature of the dropout outcome, binary logistic multilevel modelling in HLM (7.01) was used to test the hypotheses. A two-level model with clients nested within clinicians was tested. Level I consisted of hypothesized client characteristics (problem type, baseline symptom severity, age, race/ethnicity, and income) as well as process factors averaged across sessions (average parent-rated alliance, average client-rated alliance, average therapist competence and average therapist adherence). Level II consisted of available therapist discipline. The two-level model partitions the total variability into two components: the variability within patients at level 1 and the variability between therapists at level 2.

First an unconditional model with no predictors at either level was run to determine the magnitude of the association between therapists and dropout, and the average probability of dropping out of treatment, across all therapists and clients. Then for each group of hypotheses (child-report and caregiver-report), a final conditional

model was run to address the research question of which client, therapist, and process factors predict dropout.

Because of well documented discrepancies regarding parent-report and child report (Hawley & Weisz, 2005) separate parent-report and child-report models were run. Due to study protocol that assessed TASC-C data from clients over the age of seven and clients who met directly with the therapist (so no clients of any age with the Conduct problem area designation) including both parent-report and child-report variables in the same model artificially limited the sample size. As such two sets of analyses were performed: one that included the YSR and child-rated therapist alliance (and all other predictor variables), and one that included the CBCL and caregiver-rated therapist alliance (and all other predictor variables of interest). Each model and the differences in results between them are discussed below.

RESULTS

Descriptive Statistics

Baseline descriptive statistics and frequency statistics at the client level (Level 1) are displayed in Table 1. Client average age was 9.96 (*SD* = 2.57, range = 6.0 – 15.96). Regarding race/ethnicity, 84.5% of the sample was identified as Caucasian, with the next largest ethnicity identifying as "mixed" or "other" (10.7%). Within the sample, 65.5% indicated that their household income was < 39,000 per year. Of the four potential primary problem designations (anxiety, depression, conduct, trauma) 43.5% of the sample had the primary problem designation of conduct disorder, with depression accounting for the second highest proportion of the sample at 31.5%. Baseline symptom severity on average, as measured by the CBCL, was in the clinically significant range with an average score 67.80 (range = 45 – 80).

Descriptive statistics for the therapy process variables (Level I) are displayed in Table 2. 169 total clients had complete data across 50 therapists. There were 118 clients with child-rated therapeutic alliance. Average child-rated therapeutic alliance scores across sessions was 17.82 (*SD*= 5.01), with a minimum score of 8.25 and a maximum score of 36.00 (the maximum points possible). Parent-rated therapeutic alliance was gathered for 168 clients. Average scores across sessions was 27.91 (*SD*= 5.32, range = 11 – 36). Average adherence across clients was 57.36, which indicates that on average, just over half the time spent in sessions was dedicated to MATCH content material. However, the average range of five minute segments in which some content material was covered ranged from 0% to 100%. The average range of observed therapist competence also

varied across the entire range of scores of one to four, with an average competence across sessions of 2.13, which indicates that across sessions, on average, the therapist's use of content skills was acceptable.

Associations among Level 1 variables, not accounting for the nested nature of the data, are presented in Table 3. Child-rated therapeutic alliance was weakly associated with a problem area designation of trauma (r=.19, p = .037) income (r=.19, p = .044), and baseline CBCL scores (r = .20, p =.03); and child-rated thereapeutic alliance was moderately associated with parent-rated therapeutic alliance (r= -.30, p = .001), and therapist competence (r= -.31, p = .001). Not surprisingly, the YSR and CBCL were moderately associated (r = .26, p < .001). This association between child and parent report is consistent with meta-analytic results (Achenbach, McConaughy, & Howell, 1987). Additionally, adherence and competence were strongly associated (r=.54, p<.001). This association is expected because one needs to adhere to at least one content area in order to receive a competence rating.

HLM analysis

Unconditional Model. Results of the unconditional HLM model indicated that on average across all clients in all therapists, dropout was significantly different from zero (γ_{00}= -0.3714; *SE* = .1558; t =-2.38; p=0.021). The variance between therapists in therapist-average log-odds of dropout was insignificant (τ_{00} =0.02006, χ^2= 50.024; p = .433); this indicates that there is no significant variance in dropout based on therapist. However, considering the nested nature of the data structure, a multilevel model more accurately captures the way in which the data were actually structured.

Conditional model. As mentioned previously, two separate models were run: one model with the YSR as the measure of baseline severity and the TASC-C as the measure of therapeutic alliance; and one model with the CBCL as the measure of baseline severity and the TASC-P as the measure of therapeutic alliance. In both models, income, age, baseline severity measures, therapeutic alliance measures, competence, and adherence were group-mean centered. Race/ethnicity and problem area were categorical variables with multiple categories. As such, they were dummy coded with Caucasian and conduct problems serving as the reference groups, respectively, as those were the categories with the majority of responses. Additionally, due to the low number of certain racial/ethnic groups (Black, Asian, Native American) in the sample, these groups were necessarily collapsed into an "Other/ mixed race" category. At level 2, Therapist Discipline was a categorical variable dummy coded so "Social Worker" was the reference group.

Child-report model. The final logistic multivariate model that included the YSR and child-rated alliance (TASC-C) is visible in Table 4. Having a primary problem of depression was the only variable that was significantly predictive of dropout (β = -1.2181, *SE* = 0.5279; p = 0.025). A child with depression as the primary problem was less likely to dropout than children with a conduct designation, controlling for all other fixed and random effects. The odds of an individual with a conduct designation dropping out was 3.4 times the odds of a client with depression dropping out, holding all else constant. Additionally, identifying as "other" or mixed race trended towards being significantly predictive of dropout, with individuals in this category having an odds of dropping out that were .2031 times the odds of a Caucasian individual dropping out (β = -1.5939, *SE* = 0.8169; p =

0.056), controlling for all other fixed and random effects. In other words, Caucasian clients were 2.9 times more likely to dropout than "other" or mixed race clients, holding all else constant.

Parent-report model. In the model that included the CBCL and parent-rated alliance (Table 5), the problem area designation of depression was was significantly predictive of dropout (β = -0.8964, *SE* = 0.4359; p = 0.042). A child with a designation of depression was less likely to dropout than children with a conduct designation, controlling for all other fixed and random effects; specifically, those with a conduct designation were 2.5 times more likely to dropout than those with a depression designation, all else constant. The TASC-P also approached significance (β = -0.0923, *SE* = 0.0467; p = 0.051). These results indicate that as parent-rated therapeutic alliance increased by one point, the odds of the client dropping out of the therapy tended to increase by a factor of 0.9118; in other words, holding all fixed and random effects constant, as parent-rated therapeutic alliance decreased by one point, individuals were 1.1 times more likely to drop out.

DISCUSSION

The current study sought to expand prior theoretical frameworks for depression and drew on the Quality of Care framework to examine structural and potential process predictors of dropout in an effectiveness trial of MATCH, a modularized treatment protocol. Two separate models with youth clients nested within therapists were tested: one that included child-rated baseline symptom severity and alliance, and one that included parent-rated baseline severity and alliance. The child-rater model showed that having a primary problem of depression predicted clients being less likely to drop out. Additionally, Caucasian participants tended to be more likely than participants who identified as mixed race/ "other" to dropout. Results from the parent-rater model also showed that having a primary problem of depression predicted clients being less likely to dropout. In the parent-rater model, parent-rated therapeutic alliance trended towards significance, with lower therapeutic alliance being associated with dropping out. In no models did child age, income, baseline severity, or therapist discipline significantly predict dropout, nor did child-rated alliance, treatment adherence, nor therapist competence.

Having a problem area designation of depression was associated with less likelihood of dropout than those with conduct disorder in both the child and parent rater models. Our results join the other studies that have examined this, with mixed results overall. For example, Baruch et al. (2009) found that individuals with higher self-reported anxiety and depression were more likely to continue in therapy; however, other studies have shown that depression actually increases the odds of dropping out (Gonzalez, Weersing, Warnick, Scahill, & Woolston, 2011; Wergeland et al., 2015). On the other

hand, the association between conduct problems and dropout has been found in multiple studies, with medium effect sizes (see de Haan et al., 2013), which aligns with the finding that those with a primary problem of conduct disorder were significantly more likely to drop out than those with a primary problem of depression.

In this study, a primary problem of conduct would be designated when the assessment measures indicated the greatest level of clinical difficulty or impairment was related to aggressive behavior or rule-breaking scales of the CBCL and YSR. Individuals with conduct disorder may be more likely to drop out for a variety of reasons that would fit under either a risk-factor or barriers-to-treatment model. From a risk-factor perspective, previous research has indicated that mothers of children with conduct disorder reported greater stress from their interactions with their children and from life events, and greater difficulties with their own role functioning (Kazdin, 1990). Considering parents are typically the driving force in bringing their children to therapy, it is logical that a parent with increased stress would be less likely to ensure their child attended therapy.

From a barriers-to-treatment model, it is possible that treatment demands played a role in why individuals with conduct disorder were more likely to dropout. In MATCH, the conduct treatment protocol required therapists to meet almost exclusively with the parents of a child with a conduct designation (instead of with the child themselves, as for the other primary problem designations). This treatment may not have been what the parents were expecting, since it departs from most typical individual therapies that are child focused, and this may have resulted in increased likelihood of dropout compared to the depression protocols which involved the therapist working directly with the child.

Interestingly, however, a primary problem area designation of anxiety or trauma was not significantly more likely to drop out compared to a conduct designation which would be expected if the treatment demands were really the underlying barrier to treatment that explained dropout. It is worth noting that the depression protocol is the most child-focused, whereas the anxiety and traumatic stress protocols fall somewhere in between the depression protocol and the caregiver-focused conduct protocol.

Two additional variables trended towards significance. Identifying as "other" or mixed race tended to have lower dropout rates than Caucasian individuals in the child-rater model (n=118). "Other" races in this category included African American, Asian, Native American, and individuals who identified as more than one race. This result is contrary to previous research that indicates that those from minority backgrounds are more likely to dropout (see de Haan, Boon, de Jong, & Vermeiren, 2018). However, the relevance of these findings is questionable for a variety of reasons. First, this sample was drawn from a study that took place in a small New England state, which has a majority Caucasian population, reflected in the current sample. This lack of observed racial and ethnic diversity within the sample makes it impossible to draw more nuanced conclusions regarding the role of race/ethnicity in dropout.

Secondly, the way in which race/ethnicity data were collected could have influenced the results. A comprehensive meta-analysis from de Haan and colleagues (2018) demonstrated that the number of race/ethnicities included in the analysis and the way in which ethnic minority status is grouped influences the degree to which race/ethnicity, in general, is predictive of dropout. The way in which data was collected for the current study

did not support multiple racial/ethnic identities being reported and, thus, multiracial individuals were necessarily collapsed into the "other"/mixed category. This single category could be masking valuable information regarding the relationship between race/ethnicity and dropout. However, collapsing individuals into one single "mixed" category helps to avoid double-counting respondents and inflating the number of specific racial/ethnic groups, which is especially important considering the ratio of minority individuals to Caucasian individuals in the current sample is low.

The question of how to "best" measure race/ethnicity is complicated; however, it is recommended that research allows for the selection of multiple racial ethnic categories, mirror larger racial/ethnic taxonomies (such as Census categories), and to additionally measure complex social variables for which race/ethnicity is used as a proxy (such as social support, social capital, discrimination, etc.) (Connelly, Gayle, and Lambert, 2016). Underlying social variables could explain the differences in our results between models. For example, it is probable that at least some of the caregivers were of a different race/ethnicity than the child, considering that the sample included children in foster care and of "mixed" identities. Thus, a parent may not experience the underlying biases and social support difficulties that the child experiences. Unfortunately, caregiver race/ethnicity data was not available for this analysis.

Our analysis revealed that parent-therapist therapeutic alliance also trended towards being significantly predictive of dropout. The significance of parent-therapist alliance with respect to dropout has been well established in the literature, with average (moderate) effect sizes (Garcia & Weisz, 2002; Kazdin et al., 1997; Hawley & Weisz, 2005; Robbins et al.,

2003; Garland et al., 2012; de Haan et al., 2013). Because the motivation and responsibility for initiating and attending treatment lies with the parent, it is logical that the relationship between the parent and the therapist would play a role in whether or not the parent continues with therapy for their child. The fact that parents are typically the referring source and provide transportation for their children to get to therapy could explain why parent-rated alliance and not child-rated alliance was predictive of dropout.

Considering the significant finding that those with conduct disorder are more likely to drop out of treatment, the importance of parent alliance is particularly salient. The current gold-standard evidence-based treatment for children with conduct disorder involves the therapist working with the caregivers to promote parenting strategies and disrupt coercive parent-child interactions. This presents therapists with an ideal opportunity to facilitate a strong therapeutic alliance with parents as they work together, which could in turn protect this vulnerable population from dropping out of therapy. In fact, previous research with children with disruptive behavior disorders has shown the caregiver-rated alliance to be significantly predictive of outcomes in general (Kazdin, Marciano & Whitley, 2005) and dropout specifically (Garland et al., 2012).

Most child demographic factors including income, age, and baseline severity were ultimately not significant in the current study. These findings are consistent with previous literature and support the consensus that demographics are not reliable predictors of dropout across studies (Armbruster & Fallon, 1994; Kazdin et al., 1997; de Haan et al., 2013). For example, income specifically has been shown to be linked to dropout in multiple studies (Sirles, 1990; Chen & Fortson, 2015; Wamser-Nanney & Steinzor, 2017; Lanier et

al., 2011); however, there are also multiple studies who have found that income is not a significant predictor of dropout (Kendell & Sugarman, 1997; Luk et al., 2001; McCabe, 2002; Pina, Silverman, Weems, Kurtines, & Goldman, 2003; Pellerin, Costa, Weems, & Dalton, 2010).

Similar to the above client characteristics, therapist discipline (e.g. Social Worker) was not significantly predictive of dropout. This outcome is not particularly surprising as previous literature has shown mixed results regarding the salience of therapist-level demographic factors. For example, previous research has shown that therapist experience and therapist discipline to be predictive of dropout in some studies (Sirles, 1990) and not predictive of dropout in other studies (Viale-Val, Rosenthal, Curiss & Marohn, 1984; Baruch et al., 2009). The null results in the current study, and in many of the previous ones, could be due to an insufficient sample size. In a recent study that examined the ideal sample sizes necessary to examine therapist-level effects (such as discipline), the authors found that a sample of 1200 patients is necessary to estimate therapist effects with any level of precision (Schiefele et al., 2017). Considering the median number of clients per therapist in the current study (3), the study would have needed 400 therapists to reach the 1200 necessary sample size; conversely, with the 50 therapists in the current study, each therapist would have needed to see 24 clients to precisely calculate a therapist-level effects. Moreover, therapist effects have been shown to explain only about 3-5% of the variance in therapy outcomes, depending on the study design and the use of treatment manuals (Baldwin & Imel, 2013). Considering that therapists in the current study used a treatment

manual (albeit a modularized, flexible one), it is possible that this negated any potential effect of therapist discipline.

The process factors of treatment adherence and therapist competence were not predictive of dropout in any model, contrary to hypotheses. Previous research on treatment adherence and therapist competence as it relates to youth mental health outcomes is scant, as previously mentioned. One study that looked at a combined frequency and intensity of treatment and found a trend towards a positive relationship towards session attendance ($p=.059$) (Garland et al., 2012). However, no research has directly examined in-session adherence and competence and their relationship to dropout. There are a variety of explanations for the lack of significant results related to treatment adherence and therapist competence, including the lack of a true association.

On reason for the lack of clear predictive relationship between adherence or competence and dropout could be due to the way in which adherence was assessed – with only three sessions per client coded. As some clients had more than 30 sessions, the three sessions represent less than one-tenth of the total sessions. This relatively small number of coded sessions is problematic regardless of total number of sessions, as previous studies have indicated that at least 50% of sessions or ten sessions per patient need to be coded to obtain reliable and stable measures of adherence (Southam-Gerow et al., 2018; Dennhag, Gibbons, Barber, Gallop and Crits-Christoph, 2012). While neither of these studies examined the TIEBI coding system nor a modular treatment, both studies did examine cognitive-behavioral treatments thus, it is possible that the “ten sessions per patient” rule applies.

Another potential reason for the lack of a clear predictive relationship between adherence or competence and dropout could be due to the inter-related, interactional nature of the constructs; within our sample, adherence and competence were significantly, moderately correlated ($r=.54$) at the $p \leq .001$ level. Indeed, in the TIEBI coding system to show competence in a certain domain, it is necessary to at least partially adhere to that treatment element. At a construct level, competence has been linked to therapist adherence as well, and could serve as a moderator between adherence and outcome (Barber et al., 2006). For example, if a therapist has a client who has a meltdown in session when engaging in an exposure activity, a skillful (i.e. competent) therapist would know when to stop the exposure to process, offer praise, and re-motivate the client to continue vs. pushing forward to "finish" the exposure. However, this display of competence would necessarily result in less "adherence" because the pausing, processing, and re-motivating was not a part of the prescribed treatment. Being too adherent in this case could actually lead to worse outcomes as the child may refuse to engage in more exposures or refuse to return to therapy at all. In other words, assuming adherence has a curvilinear effect, a competent therapist may be more able to reach the ideal middle ground of adherence as a reflection of skillful adaptation and specification of the intervention to the client's needs, thus making the therapist appear less adherent. Thus, if adherence really does have a curvilinear effect with outcomes (dropout included) then the current linear model would not have found a relationship between those variables.

Moreover, the Quality of Care framework posits that structural factors and outcomes interact with the process factors; however, that was not tested in the current analysis. For example, client severity may be a condition that promotes competence. More severe clients are more likely to present in-session with significant difficulties. This presentation of symptoms and difficulties allows more opportunities for therapists to show they are competent and skillful in implementing the treatment strategies. Additionally, previous research has demonstrated that adherence is associated with therapeutic alliance (the other process variable of interest). For example, Liber et al., (2010), and Hogue and colleagues (2008) found associations between adherence and therapeutic alliance. For example, in theory, if a therapist and a client agree on the goals of therapy then the client will be less resistant in therapy, allowing more time for the therapist to implement treatment strategies instead of overcoming resistance, thus, increasing adherence. In other words, it is possible that adherence and competence only indirectly relate to dropout through other variables (such as symptom severity and alliance). Future studies should utilize a more sophisticated, interactional analysis like structural equation modelling to truly examine the Quality of Care framework in the context of dropout.

Limitations

This study has a variety of limitations, many of which are typical in research that involves secondary data analysis. Missing data restricted the analytic sample size. For example, ten participants (mostly dropouts) did not have any audible session recordings, and thus did not have any adherence or competence information; an additional 22 participants did not have any alliance information and thus were excluded from the sample;

and two therapists did not complete a basic demographic questionnaire and thus all their clients were excluded from the analysis. Missing data contributed to the relatively small sample size, which in turn resulted in less power to detect potential effects. Other sample limitations involve the representativeness and diversity of the sample. The lack of diversity in the sample limited the type of questions and conclusions that could be drawn regarding the influence of race and ethnicity, despite that being a theoretical variable of interest.

Relatedly, the validity of the results is limited by the way in which many of the variables were measured. For example, income in the current study was used as a proxy variable for SES. Other studies that have used income as their proxy for SES have shown mixed results, with some demonstrating that income is predictive of dropout (Sirles, 1990; Chen & Fortson, 2015; Wamser-Nanney & Steinzor, 2017) and some showing no significant predictive effects (Pellerin et al., 2010; Luk et al., 2010). The literature recommends that using a composite SES variable is preferable, but constraints with these data make income the only available variable.

As another example, "primary problem designation" was used as a proxy variable for diagnosis. However, problem area designation is not a diagnosis, but rather represents the best categorization of primary presenting problems at intake based on the baseline measures of the CBCL and YSR and the problems nominated by the youth clients and caregivers. Because of this, it is possible that the significant results may actually be more indicative of a process-level factor regarding the acceptability of that particular cluster of treatment elements; in other words, those with a problem-designation of depression received treatment from the depression protocol and were less likely to drop out because

they found those particular practices more acceptable or fun than clients who were treated with the conduct protocol. Thus, results regarding primary problem designation are particularly muddled in this analysis. However, it is likely that primary problem designation does not completely reflect the treatment that was implemented; in theory any of the MATCH protocols can be used flexibly for any client and those with a anxiety or trauma as the presenting concern utilize many of the same or similar modules as those with a presenting concern of depression, and those with anxiety or trauma were not shown to be less likely to dropout than those with a conduct designation.

Additional, less-than-ideal, variables in the analysis included therapeutic alliance and adherence. The gold standard in therapeutic alliance measurement is observational coding (McLeod, Southam-Gerow, & Kendall, 2017). Unfortunately, no observational coding of therapeutic alliance was completed and the data drew on self-report measures of therapeutic alliance. While observational coding was utilized with regards to the adherence and competence variables, only three sessions were coded. As noted, a small number of sessions were coded for fidelity, which may not have been adequate (Southam-Gerow et al., 2018; Dennhag et al., 2012). Additionally, an analytic method that took into consideration time to dropout (with individual sessions as the level one in the multi-level model) could have yielded more nuanced results; however, the variable "number of sessions" was not reliably gathered and reported in the original study and thus the types of questions that could stem from a time-based model, if posed, could not be answered.

Conclusions and Future Directions

Dropout from child and adolescent mental health treatment is a significant concern with negative implications for both the individual and mental health systems. Previous research on youth mental health treatment dropout has looked at both client, family, and/or therapist characteristics (structural factors) and some process factors that can make continuing treatment untenable (such as therapeutic alliance and perceived relevance of treatment). The Quality of Care model provides a framework for conceptualizing the myriad of structural and process factors and their relationship to dropout. Notably, the Quality of Care framework posits that treatment adherence and therapist competence, in addition to therapeutic alliance, are key process factors that influence outcomes. This study examined various client, therapist and process factors that could influence dropout and found that primary problem area was predictive of dropout and race/ethnicity and parent-rated therapeutic alliance showed trends towards predicting dropout.

These results consistent with the risk-factor theoretical model and the barriers-to-theoretical models. However, results of this study did not support the inclusion of adherence or competence as predictors. Future research should examine these variables in more detail, specifically as they interact within the Quality of Care framework. Research utilizing methodology such as structural equation modelling would be able to examine the interactional nature of relevant structural and process factors in a way that would provide valuable insight into the phenomenon of youth mental health treatment dropout. Additionally, future research methodologies should consider the quadratic nature of some

of the variable relationships (such as adherence and competence) in order to model a non-linear relationship.

Beyond the question of how therapist adherence and competence relate to client dropout, the field would benefit from continuing to refine and understand these fidelity process variables, especially in the context of community practice. Questions of how best to reliably measure adherence and competence outside of a highly differentiated treatment (such as those found in efficacy trials) should continue to be pursued and tested. Through a deeper understanding of these factors, and the relationship between them and other relevant factors, researchers and clinicians will be able to better understand the may unique contributions of each to treatment outcomes. The goal of all therapy is to improve client outcomes, and as such, a deeper understanding of these adherence and competence can help reach those goals.

Additionally, future dropout research should continue to examine therapist relationship variables outside of therapeutic alliance. When expanding the scope of relational processes outside of therapeutic *alliance* to include other indicators of therapy relationships, other predictors emerge. Peters, Calam, and Harrington (2005) found that in their sample of children with disruptive behavior disorders, dropout was associated with therapists who used more questioning statements and fewer facilitative statements. Moreover, relationship problems, such as a perceived lack of positive regard or feeling like the therapist doesn't "like" the client, were significantly related to dropout in two retrospective chart-review studies involving multiple community mental health clinics (Garcia & Weisz, 2002; Stevens et al., 2006). Taken together, these studies suggest that

relational processes between the therapist and the parent and or the child may play a key role in treatment dropout. The Quality of Care framework does not currently incorporate general therapist relationship variables as a "process element." Expanding the framework to include these variables may strengthen the ability of the model to predict dropout as an outcome.

Identifying a unifying framework from which to study dropout is a crucial step in understanding the complicated factors that may contribute to this phenomenon. Understanding both the structural and process elements that contribute to dropout and the way in which these elements interact, will help with the development of future interventions targeted at minimizing attrition. Through minimizing dropout, children and adolescents will stay in therapy and thus be more likely to receive the services to help them get better and avoid the negative outcomes associated with untreated mental health problems.

Appendix

Figure 1: Model of dropout within a quality of care framework

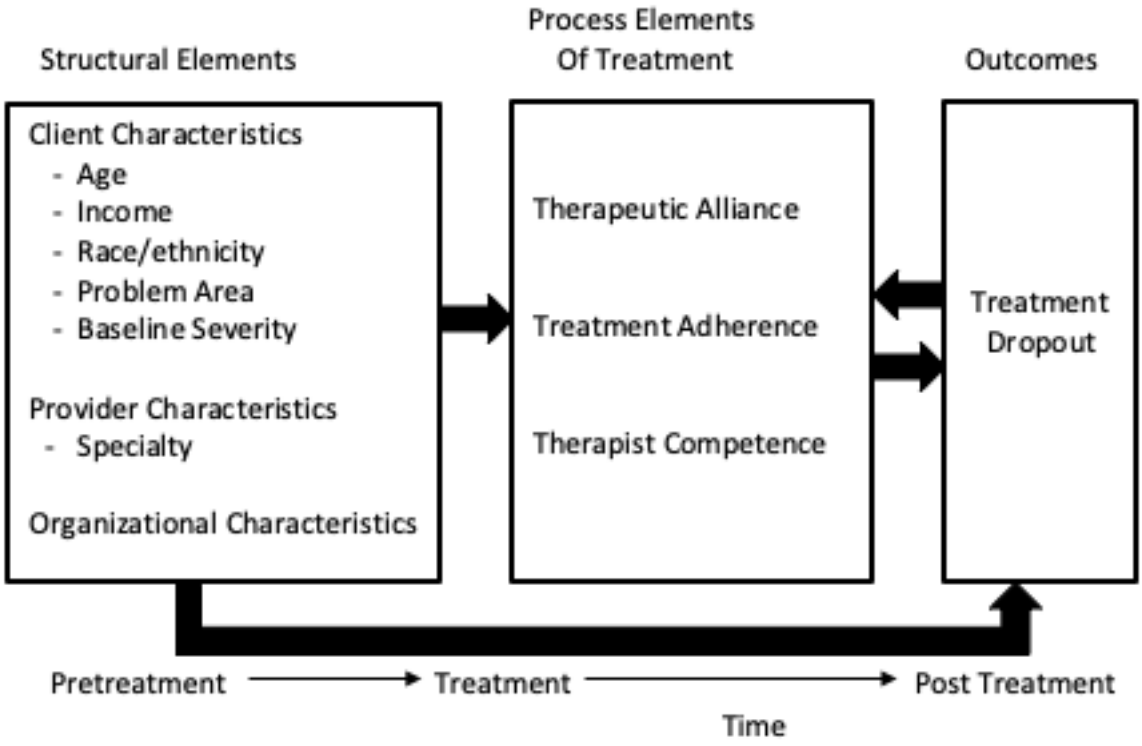

Table 1: Client Baseline Characteristics

	Dropouts n= 69	Non-dropouts n= 99	Total n= 168
Gender			
Male	27	43	70
Female	42	56	98
Mean Age (SD)	9.57 (2.51)	10.18 (2.55)	9.93 (2.55)
Problem Area			
Anxiety	15	14	29
Depression	13	40	53
Conduct	36	37	73
Trauma	5	9	14
Race/Ethnicity			
Caucasian	62	80	142
African American	1	2	3
Hispanic	2	3	5
Mixed/Other	4	14	18
Income			
<19,000	25	25	50
20k-39k	27	33	60
40k-59k	8	13	21
60k-79k	5	11	16
80k-99k	3	10	13
>100,000	1	7	8
Baseline CBCL (SD)	68.09 (6.49)	67.40 (7.63)	67.8 (7.14)
Baseline YSR (SD)	n=83 57.55 (8.86	n=49 57.02 (9.36)	n=132 57.32 (9.02)

Table 2: Process statistics by group

	Dropouts M (SD)	Completers M (SD)	Total M(SD)
TASC_P	n=67 26.46 (5.77)	n=98 28.89 (4.77)	n=165 27.91 (5.32)
TASC_C	n=43 18.27 (5.26)	n=75 17.56 (4.88)	n=118 17.82 (5.01)
TIEBI Data	n= 69	n= 99	n=168
Mean Adherence	56.22 (20.89)	58.16 (20.69)	57.36 (20.73)
Mean Competence	2.14 (0.71)	2.13 (0.59)	2.13 (0.64)

Table 3: Associations Among Level 1 Predictors

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Child Age	1											
2. Hispanic	-.06	1										
3. Other	-.06	-.05	1									
4. Anxiety	-.11	-.06	-.05	1								
5. Depression	.18*	.01	.03	-.31**	1							
6. Trauma	.12	.12	.07	-.14	-.20**	1						
7. Income	-.01	-.10	-.08	.034	.04	-.03	1					
8. CBCL	-.02	.02	.13	.01	-.06	-.06	.12	1				
9. YSR	.04	.03	.06	-.04	.03	.08	-.03	.26**	1			
10. TASC-C	.03	.03	-.11	.10	-.09	-.19*	.19*	.20*	-.00	1		
11. TASC-P	.08	-.04	.04	-.01	.05	.10	.07	-.08	-.16	-.30**	1	
12. Competence	-.01	-.11	.00	.07	.06	-.04	-.00	-.05	-.18*	-.31**	.08	1
13. Adherence	.05	-.07	-.09	-.00	-.03	-.15	.04	-.04	-.13	-.10	.08	.54**

*significant at the p<.05 level
**significant at the p<.01 level

Table 4: *Fixed and Random Effects from Child Report Final Model*

Level 1: $Prob(DROPOUT_{ij}=1|\beta_j) = \phi_{ij}$

$\log[\phi_{ij}/(1 - \phi_{ij})] = \eta_{ij}$

$\eta_{ij} = \beta_{0j} + \beta_{1j}(AGE_{ij}) + \beta_{2j}(INCOME_{ij}) + \beta_{3j}(YSR_{ij}) + \beta_{4j}(TASC\_C_{ij}) + \beta_{5j}(COMP_{ij}) + \beta_{6j}(ADHERE_{ij}) + \beta_{7j}(HISPANIC_{ij}) + \beta_{8j}(OTHER) + \beta_{9j}(ANXIETY_{ij}) + \beta_{10j}(DEPRESS) + \beta_{11j}(TRAUMA_{ij})$

Level 2: $\beta_{0j} = \gamma_{00} + \gamma_{01}(COUNSELOR_j) + \gamma_{02}(PSYCH) + u_{0j}$

$\beta_{1j} = \gamma_{10}$

$\beta_{2j} = \gamma_{20}$

$\beta_{3j} = \gamma_{30}$

$\beta_{4j} = \gamma_{40}$

$\beta_{5j} = \gamma_{50}$

$\beta_{6j} = \gamma_{60}$

$\beta_{7j} = \gamma_{70}$

$\beta_{8j} = \gamma_{80}$

$\beta_{9j} = \gamma_{90}$

$\beta_{10j} = \gamma_{100}$

$\beta_{11j} = \gamma_{110}$

Fixed Effects	*Coefficient*	*se*	*t Ratio*	*p Value*	*Odds Ratio*
INTRCPT, γ_{00}	0.0466	0.3313	0.141	0.889	1.0477
COUNSELOR, γ_{01}	-0.1019	0.5950	-0.171	0.865	0.9031
PSYCH, γ_{02}	0.2606	1.0425	0.250	0.804	1.2978
AGE slope, γ_{10}	-0.2235	0.1613	-1.386	0.171	0.7997
INCOME slope, γ_{20}	-0.2696	0.2079	-1.297	0.200	0.7637
YSR slope, γ_{30}	0.0217	0.0314	0.692	0.492	1.0220
TASC_C slope, γ_{40}	-0.0389	0.0619	-0.629	0.532	0.9618
COMP slope, γ_{50}	-0.4666	0.6367	-0.733	0.467	0.6271
ADHERE slope, γ_{60}	0.0016	0.0180	0.091	0.928	1.0016
HISPANIC slope, γ_{70}	-0.6905	1.3547	-0.510	0.612	0.5013
OTHER slope, γ_{80}	-1.5939	0.8169	-1.951	0.056	0.2031
ANXIETY slope, γ_{90}	-0.0244	0.5917	-0.041	0.967	0.9759
DEPRESS slope, γ_{100}	-1.2181	0.5279	-2.307	0.025	0.2958
TRAUMA slope, γ_{110}	-0.7736	0.8148	-0.949	0.346	0.4613

Random Effect	*Variance Component*	*df*	χ^2	*p Value*
INTRCPT, u_{oi}	0.0003	46	37.2696	>0.50

Table 5. *Fixed and Random Effects from Caregiver Report Final Model*

Level 1: $Prob(DROPOUT_{ij}=1|\beta_j) = \phi_{ij}$

$\log[\phi_{ij}/(1 - \phi_{ij})] = \eta_{ij}$

$\eta_{ij} = \beta_{0j} + \beta_{1j}(AGE_{ij}) + \beta_{2j}(INCOME_{ij}) + \beta_{3j}(CBCL_{ij}) + \beta_{4j}(TASC\_P_{ij}) + \beta_{5j}(COMP_{ij}) + \beta_{6j}(ADHERE_{ij}) + \beta_{7j}(HISPANIC_{ij}) + \beta_{8j}(OTHER) + \beta_{9j}(ANXIETY_{ij}) + \beta_{10j}(DEPRESS) + \beta_{11j}(TRAUMA_{ij})$

Level 2: $\beta_{0j} = \gamma_{00} + \gamma_{01}(COUNSELOR_j) + \gamma_{02}(PSYCH) + u_{0j}$

$\beta_{1j} = \gamma_{10}$

$\beta_{2j} = \gamma_{20}$

$\beta_{3j} = \gamma_{30}$

$\beta_{4j} = \gamma_{40}$

$\beta_{5j} = \gamma_{50}$

$\beta_{6j} = \gamma_{60}$

$\beta_{7j} = \gamma_{70}$

$\beta_{8j} = \gamma_{80}$

$\beta_{9j} = \gamma_{90}$

$\beta_{10j} = \gamma_{100}$

$\beta_{11j} = \gamma_{110}$

Fixed Effects	*Coefficient*	*se*	*t Ratio*	*p Value*	*Odds Ratio*
INTRCPT, γ_{00}	0.0214	0.2894	0.074	0.941	1.0217
COUNSELOR, γ_{01}	-0.1664	0.5518	-0.302	0.764	0.8467
PSYCH, γ_{02}	0.5484	0.8649	0.634	0.529	1.730
AGE slope, γ_{10}	-0.0530	0.0851	-0.623	0.535	0.9484
INCOME slope, γ_{20}	-0.1588	0.1623	-0.997	0.330	0.8531
CBCL slope, γ_{30}	0.0076	0.0299	0.254	0.800	1.0076
TASC_P slope, γ_{40}	-0.0923	0.0467	-1.978	0.051	0.9118
COMP slope, γ_{50}	0.3089	0.4203	0.735	0.464	1.3619
ADHERE slope, γ_{60}	-0.0095	0.0136	-0.704	0.483	0.9905
HISPANIC slope, γ_{70}	-0.4794	1.3730	-0.349	0.728	0.6191
OTHER slope, γ_{80}	-0.9300	0.5694	-1.633	0.106	0.3946
ANXIETY slope, γ_{90}	0.0118	0.4797	0.025	0.980	1.0119
DEPRESS slope, γ_{100}	-0.8964	0.4359	-2.056	0.042	0.4080
TRAUMA slope, γ_{110}	-0.5949	0.6891	-0.863	0.390	0.5516

Random Effect	*Variance Component*	*df*	χ^2	*p Value*
INTRCPT, u_{oi}	0.23651	47	52.504	0.269

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